

PATENT SPECIFICATION

788,142



Date of Application and filing Complete Specification: April 17, 1956.

No. 11614/56.

Application made in Germany on April 23, 1955.

Complete Specification Published: Dec. 23, 1957.

Index at Acceptance:—Class 86, C(1 : 8 : 18G3).

International Classification:—B02g.

COMPLETE SPECIFICATION

Improvements in or Relating to Stirring Machines.

I, OSCAR ULRICH, trading as HAAGEN & RINAT, of 210 Hemmstrasse, Bremen 8, Germany, a German citizen, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to stirring machines of the kind comprising a tiltable bowl and a stirring implement which is rotatably mounted in a planetary stirring head and, apart from its own rotation, also carries out a circulating movement about the axis of the bowl.

Machines of this kind known hitherto, which are used predominantly in the food-stuffs industry and in the chemical, pharmaceutical and synthetic plastics industries, are suitable in each case only for a limited number of operations, so that many different constructions are necessary in order that the various stirring, mixing and kneading operations may be carried out.

According to the present invention a stirring machine of the kind referred to is characterised in that both the planetary stirring head and the stirring implement are each provided with a separate drive arrangement secured to the bowl with an arrangement for variation of the speed of rotation, and/or the reversal of the direction of rotation of the head or implement. Interchangeable stirring implements and/or interchangeable stirring heads may be provided. Further and optional features of the invention appear from the following description and claims.

An advantage of the drive systems arranged independently of one another consists in the possibility of tilting the bowl while the stirring implement is running, and thus expediting the discharge of the contents. Furthermore the stirring implement automatically scrapes off the inner bowl walls and thus effects an almost complete emptying of the bowl during this operation.

The self-locking drive system for the tilting

[Price 3s. 6d.]

device, not illustrated here in greater detail, permits of working with tilted bowl, which can be advantageous especially in the case of slight filling of the bowl.

The equipment of the bowl, known *per se*, with a jacket or tubular coil renders possible heating and cooling of the contents of the bowl, and thus provides further spheres of use for the proposed universal machine.

An example of embodiment of this proposed combination is illustrated in the accompanying drawing, wherein:

Figure 1 is a section through the machine, with tilted implement axis,

Figure 2 is a plan view of the same arrangement,

Figure 3 is a section through the machine with continuous tilted implement spindle and two stirring implements,

Figure 4 is a partial section through the machine with vertical implement spindle,

Figure 5 is a plan view of this arrangement.

The gear of the machine, with the bowl 1 and the stirring device, forms a compact unit, which is secured on the tilting axis 3 rotatably mounted in the base 2. A motor-driven tilting device, housed in the base 2 and not illustrated in greater detail here, with deviation from the vertical limited by crank motion, effects the tilting out of the bowl 1, which however can also be held in any desired oblique position within its range of deviation, as a result of the self-locking drive. The gear housing 4 is provided with a hollow column 5, upon the flange 6 of which the bowl 1, equipped with a heating jacket 7, is secured. As support for the interchangeable planetary stirring head 8 or 25 there serves a hollow spindle 9, which is rotatably mounted in the hollow column 5 and carries a worm wheel 10 at its lower end, which worm wheel is in engagement with the worm 11 and receives its drive from the pole-changeable motor 12. The pole-changeable motor 13 arranged together with the latter beneath the gear housing 4 drives a shaft 16

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mounted within the hollow spindle 9, through a worm 14 and worm wheel 15, the rotation of the shaft 16 being transmitted through the bevel gears 17 and 18 to the implement spindle 20 mounted in oblique position in the interchangeable planetary stirring head 8 and the lid 19 thereof. The stirring implement 21 is interchangeable and is connected with the implement spindle 20 by screws 22. In the form as represented the stirring implement 21 effects an intensive layer-shifting of the material to be mixed, the bottom, walls and central column of the bowl being stripped off at every revolution of the implement. According to the consistency of the material being mixed stirring implements can be used in various forms. If necessary the stirring and mixing process can be supported by a stripper 23, the holder 24 of which should advantageously be arranged on the cover 19 of the planetary stirring head 8. In Figure 3 there is shown a planetary stirring head with an obliquely disposed continuous implement spindle and two stirring implements. This arrangement is especially suitable for bowls which are very high in relation to their diameter.

In Figures 4 and 5 there is shown the example of embodiment of a planetary stirring head 25 with a vertical implement spindle 26. As the head 25 possesses the same plane of separation as the planetary stirring head 8, it can be interchanged with the latter and can be secured, like the latter, by means of the screws 27 on the hollow spindle 9. The small bevel gear 17 on the shaft 16 is exchanged in this case for a spur gear 28, which meshes with the spur gear 29 secured on the vertical implement spindle 26. The implement spindle 26 is conducted upwards through the cover 30, and carries at its upper end the stirring implement 31, similarly interchangeable, the diagram of movement of which fills out the entire bowl profile with the exception of the usual clearance, as is the case also with the stirring implement 21 in Figures 1 and 2.

The switch gear 32 for the main connection, the tilting motor (not shown), the stirring head motor 12 and the stirring implement motor 13 are arranged on a switch-box 33 arranged on

the base 2. The switches for the control of the stirring head motor 12 and the stirring implement motor 13 are pole-reversing multiple switches, which permit operation in both directions of rotation and with a plurality of speeds of rotation. The control valve 34, similarly arranged on the switch-box 33, regulates the through-flow of the heating or cooling medium. With this arrangement the material for mixing can be heated up and cooled down again during a working cycle.

What I claim is:—

1. A stirring machine with a tiltable bowl and a stirring implement which is rotatably mounted in a planetary stirring head and, apart from its own rotation, also carries out a circulating movement about the axis of the bowl, characterised in that both the planetary stirring head and the stirring implement are each provided with a separate drive arrangement secured to the bowl with an arrangement for variation of the speed of rotation, and/or for the reversal of the direction of rotation of the head or implement.

2. A machine according to claim 1, wherein both the planetary stirring head and the stirring implement are exchangeable with other planetary stirring heads or stirring implements having different actions.

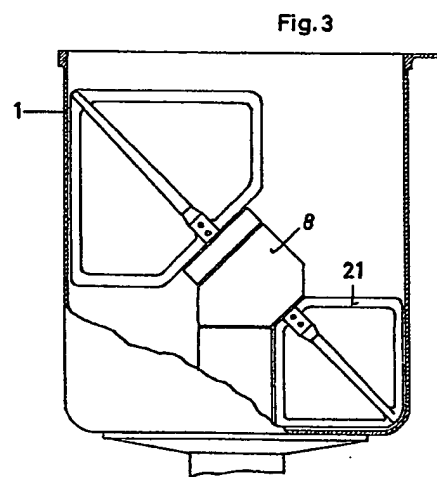
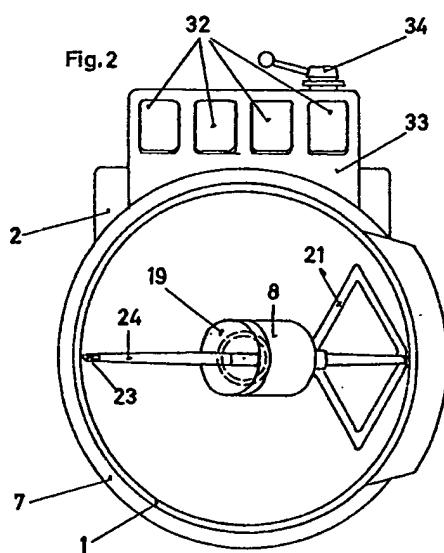
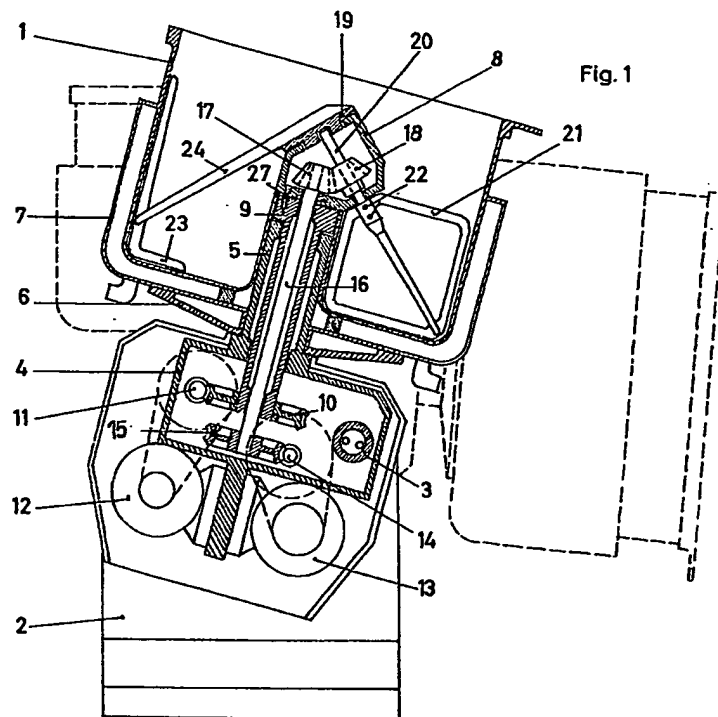
3. A machine according to claim 1 or 2, wherein a spindle for the stirring implement is arranged to a drive shaft for the stirring implement.

4. A machine according to claim 3, wherein the spindle carries a stirring implement at each end.

5. A machine according to claim 1 or 2, wherein a spindle for the stirring implement is parallel to a drive shaft for the stirring implement.

6. A stirring machine constructed and arranged substantially as hereinbefore described with reference to and as shown in Figures 1 to 3 or Figures 4 and 5 of the accompanying drawings.

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2 SHEETS

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the Original on a reduced scale.

SHEETS 1 & 2

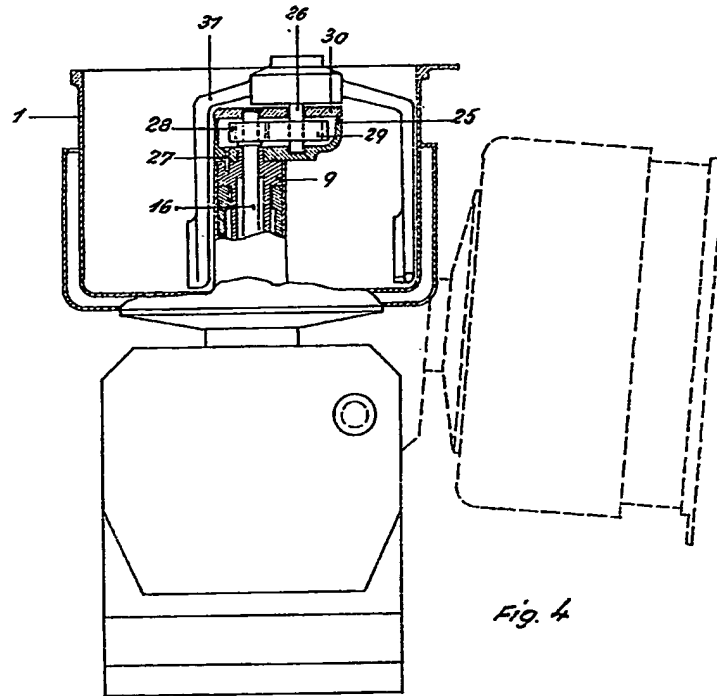


Fig. 4

Fig. 3

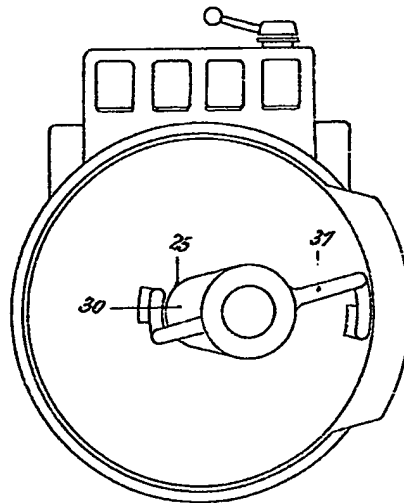
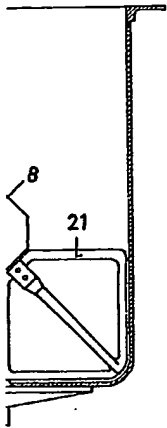


Fig. 5

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 2 SHEETS
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 the Original on a reduced scale.
 SHEETS 1 & 2

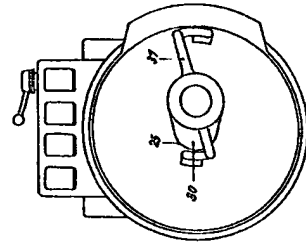
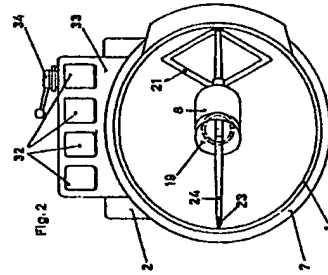
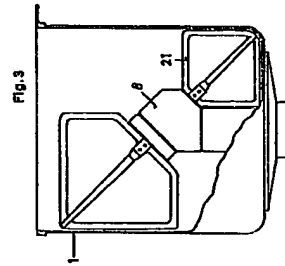
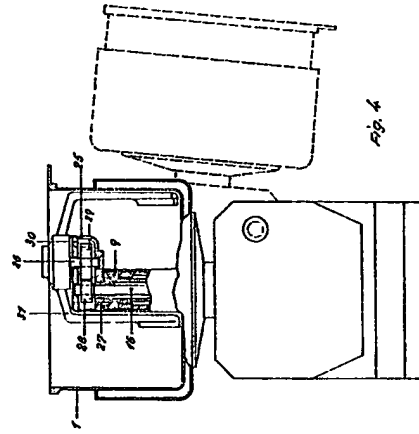
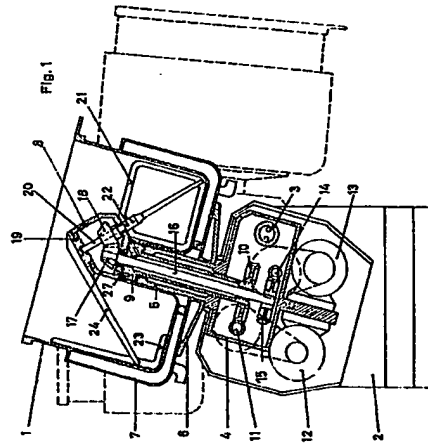


Fig. 5

Fig. 4

Fig. 1

Fig. 3

Fig. 2